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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/656,416
Filing Date: September 05, 2003
Appellant(s): BEASLEY ET AL.

Brian C. Ellsworth
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 9/12/2007 appealing from the Office action mailed 10/4/2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

.(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is deficient. 37 CFR 41.37(c)(1)(v) requires the summary of claimed subject matter to include: (1) a concise explanation of the subject matter defined in each of the independent claims involved in the appeal, referring to the specification by page and line number, and to the drawing, if any, by reference characters and (2) for each independent claim involved in the appeal and for each dependent claim argued separately, every means plus function and step plus function as permitted by 35 U.S.C. 112, sixth paragraph, must be identified and the structure, material, or acts described in the specification as corresponding to each claimed function must be set forth with reference to the

specification by page and line number, and to the drawing, if any, by reference characters. The brief is deficient because:

on p 3, the reference at the end of line 6 carrying over to line 7 should read page 5, lines 9-24 to more fully support the Claim 1.

on p 3, the references given in support of Claim 12 (3rd line from bottom) do not disclose the limits of between 1 and 40 percent sawdust for an individual layer, but for a sheet, which may comprise multiple layers. Examples are given in the Specification on p 6, lines 5-12 of layers having 5% and 30% by weight of sawdust, which values fall within the claimed limits. Reference to the claimed 1 and 40 percent sawdust limitations is only found in the claim itself.

on p 4, the references given in lines 4-5 for support of Claim 14 do not disclose that the high-density layers are adhered together. Reference to the claimed limitations is only found in the claim itself.

on p 4, 2nd paragraph, the reference "page 5, lines 9-15" in line 7 should read page 5, lines 9-24 to more fully support Claim 15.

on p 4, 3rd paragraph, the reference "page 5, lines 9-18" in line 8 should read page 5, lines 9-24 to more fully support Claim 19.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5770013	Chance et al	6-1998
1765860	Clapp	6-1930
5203965	McCowan	4-1993
5227024	Gomez	7-1993
5505395	Qiu et al	4-1996
6033352	Howard et al	3-2000

It is noted that the brief (p 6, last paragraph) refers to the document "Aldrich, Catalog/Handbook of Fine Chemicals, T848 (2003-2004)" as allegedly included in the Evidence Appendix. The Aldrich document is missing. A different document, page 473 from "Pulp Technology and Treatment for Paper," which was provided in a previous Office Action, is included in the Evidence Appendix instead. The referened Aldrich document was previously submitted on 1/4/2007 in an after-final amendment, which was not entered. Consequently, the document will not be considered.

It is further noted that the discussion of the missing document in the brief teaches only what is generally known to those of ordinary skill in the art concerning sieves of different mesh sizes.

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chance et al (5770013) in view of Clapp or McCowan (5203965).

Chance et al discloses a 3-ply paperboard comprising wood (cellulose) fibers and sawdust. The wood fiber material is present in an amount of about 20-25% by weight of the paperboard and comprises from 5-70% sawdust (col 4, lines 36-39 and col 8, lines 32-38). Thus, the amount of sawdust that can be present by weight of the multi-ply paperboard can be from 1 to 17.5%, which significantly overlaps the claimed ranges.

Chance et al does not disclose the particle size of the sawdust.

Clapp discloses a multi-layer liner board or paper comprising a bottom layer containing cellulosic fibers and a top layer having 5-20 parts by weight bleached sulphite pulp, 10-20 parts wood flour or sawdust, and 75 to 105 parts other material (Claim 1; p 1, lines 58-72; p2, lines 5-13, 70-74). The sawdust can thus be present in the top layer in an amount between 7.4 and 20% by weight. The sawdust particles are capable of passing through a 40-80 mesh sieve, or having a particle size range from about 177 to about 420 μm (p2, lines 5-13, 71-74). The range of acceptable particle sizes significantly overlays the claimed range. Although the densities of the layers are not disclosed, the two layers are made from very different compositions of materials and would obviously have very different densities (the top layer includes 50 to 70 parts by weight of china clay or kaolin, which is much denser than the fibers). Clapp discloses that the layers of the sheet are contacted prior to drying (p 1, lines 75-84). Clapp is silent as to the thickness of the layers; however, the reference encompasses embodiments wherein the top layer is of sufficient mass that the overall sheet contains greater than 1% sawdust by weight. Clapp discloses that the product made using sawdust with the disclosed particle sizes forms well on a cylinder mould (p 2, lines 71-

76). Although Clapp is of the opinion that the results are not quite as satisfactory when finely divided sawdust is used as when wood flour (smaller particle sizes) is used, the disclosure does not discourage the use of the finely divided sawdust.

McCowan et al discloses that making a paper using sawdust that has been screened to a particle size of greater than about 1/16 inch (about 1590 μm) results in paper having good strength properties (TSF factor). McCowan also discloses that the paper can have at least 30% sawdust (Abstract; col 1, lines 37-44; col 4, line 51 to col 5, line 11).

The art of Chance et al, Clapp, McCowan and the instant invention are analogous because they deal with the making of paper in general and specifically paperboard having sawdust particles. Clapp discloses paperboard having sawdust with particle sizes in the lower portion of the claimed range to obtain good formation properties. McCowan discloses paperboard having sawdust with particle sizes in the upper portion of the claimed range to obtain good strength properties. Depending on the needs for the particular paperboard, it would have been obvious to one skilled in the art at the time of the invention to obtain 95% of sawdust particles having a size between 1590 and 3175 μm or between 350 and 420 μm in the paperboard of Chance et al in view of Clapp or McCowan to obtain good strength or good formation properties.

Claims 5-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chance et al in view of Clapp or McCowan and further in view of Gomez (5227024) and Qiu et al (5505395).

Chance et al, Clapp and McCowan are used as above. Clapp discloses that the layers of the sheet are contacted prior to drying (p 1, lines 75-84). Chance et al discloses that the three layers are brought into contact before the drying stage of the process (col 5, lines 57-67). McCowan teaches that sawdust is used because it is cheaper than wood chips and is readily available from lumber production (col 1, lines 53-57).

Chance et al, Clapp and McCowan do not disclose low density and high density layers or that at least two low density layers are sandwiched between two high density layers. Chance et al, Clapp and McCowan further do not disclose the sawdust content of at least one high density layer or that the layers are adhered together.

Qiu et al discloses a spirally wound paperboard tube having multiple plies of lower and higher densities, wherein the lower density paperboard is at least 3% lower than the higher density paperboard. The tube has at least one lower density layer sandwiched between two higher density structural layers (Abstract). Qiu et al also discloses that in a preferred embodiment, there are at least two centrally located lower density layers (col 3, lines 66-67 and col 4, lines 1-2). Qiu et al further discloses that the plies are coated with adhesive prior to winding to adhere them together (col 8, lines 47-49). Qiu et al teaches that it is well known in the art to use paperboard plies of widely varying densities to form paperboard tubes and that the densities range from 0.5 to 0.9 g/cm^3 (col 6, lines 60-66).

Qiu et al teaches that the density of paperboard can be varied by varying raw materials or additives (col 6, line 67 and col 7, lines 1-3). Qiu et al does not teach that adding sawdust can change the density of the paperboard.

Gomez discloses a process for reducing the density of a paper by adding inexpensive vegetable filler (such as waste wood from sawing and planing processes) (Abstract; col 5, lines 58-63). While Gomez uses sawdust with 95% of the particles smaller than 150 μm in size, the size limitation is only disclosed as being required for good sheet formation and minimizing defects in uniformity and not for lowering density (col 6, lines 9-16).

The art of Chance et al, Clapp, McCowan, Qiu et al, Gomez and the instant invention are analogous because they deal with the making of paper and paperboard products. It would have been obvious to one skilled in the art at the time of the invention to use layers of different densities in the paperboard of Chance et al in view of Clapp or McCowan and further in view of Qiu et al and Gomez to lower the cost of the paperboard (via addition of sawdust) yet maintain structural strength with the high density layer. It would have also been obvious to include sawdust in the high density layer for cost savings or to omit it if higher strength is needed. It would have been obvious to adhere the layers together to incorporate strength into the final multi-layered sheet. Since a common use of paperboards is the formation of multi-layered paperboard tubes, it would have been obvious to a person of ordinary skill in the art to make paperboard tubes having multiple layers with the inexpensive lower density layers

in the center of the wall sandwiched by the stronger high density layers to provide structural strength.

Claims 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chance et al in view of Clapp or McCowan and further in view of Gomez, Qiu et al and Howard et al (6033352).

Chance et al, Clapp, McCowan, Gomez and Qiu et al do not disclose that a paperboard ply wound to form a tube is overlapped on itself.

Howard et al discloses various methods for winding paperboard plies to form a spirally wound tube. In one method, the final ply is wrapped to overlap itself at the seam (col 4, lines 37-41).

The art of Chance et al, Clapp, McCowan, Qiu et al, Gomez, Howard et al and the instant invention are analogous because they deal with the making of paperboard and paperboard products.

It would have been obvious to one skilled in the art at the time of the invention to overlap the paperboard winding on itself to make a tube with the paperboard of Chance et al in view of Clapp or McCowan and further in view of Qiu et al, Gomez and Howard et al to increase the strength of the tube.

(10) Response to Argument

1. Rejections under 35 U.S.C. 103(a) based on Chance in view of Clapp or McCowan.

A. Independent Claim 1.

Applicant argues at the top of p 6 that Chance fails to teach that any part of its sawdust lies within the claimed particle size limits. The Examiner agrees, ergo the combination with Clapp or McGowan.

With regard to Clapp, Applicant agrees that the disclosed particle size overlaps the lower portion of the claimed range (pp 5-6). Applicant argues (pp 6-8) that there is no disclosure or suggestion that would direct one of skill in the art to adopt a particle size within 350 to 420 μm (the portion of the disclosed range that overlaps the claimed range) and further that the lower limit of 350 μm is drawn from the instant Specification. Applicant also argues that one of ordinary skill would be directed to smaller particle sizes to more closely approximate Clapp's desired material, wood flour. Applicant argues that there is no teaching or suggestion to select a larger, less desirable particle size heavily focused toward the upper limit of 420 μm. Applicant finally points out that the Examiner previously agreed with Applicant's arguments regarding Clapp's desired material and withdrew a prior obviousness rejection of Claim 1 over Clapp alone.

The Examiner disagrees. Upon further consideration of the Clapp reference, the Examiner finds that the disclosure of Clapp is applicable to the current rejections and may have applicability in the withdrawn rejection as well. However, only the current rejections will be discussed. Clapp discloses that the product made using sawdust with the disclosed particle sizes forms well on a cylinder mould (p 2, lines 71-76). Although Clapp is of the opinion that the results are not quite as satisfactory when finely divided sawdust is used as when wood flour (smaller particle size) is used, the disclosure does not in any way discourage the use of finely divided sawdust and, in fact, discloses that

the finely divided sawdust can be substituted for the wood flour and remain within the spirit and scope of the invention (p 2, lines 68-75). It is therefore considered by the Examiner to have been obvious to one of ordinary skill in the art to use sawdust having particle sizes anywhere in the range disclosed by Clapp, including sizes within the portion of the disclosed range overlapping the claimed range (e.g.- from 350 to 420 μm) as a functionally equivalent option with the predictable result of obtaining good formation.

With regard to McCowan, Applicant agrees on pp 8-9 that the disclosed range overlaps the upper half of the claimed range of particle sizes. Applicant argues that McCowan is concerned with using fibers sufficiently long to produce a tissue paper having an acceptable total strength factor and that larger sawdust particles are preferred while smaller particles (i.e.-fines and flour) are desirably removed. Applicant further argues that it would be apparent to one of ordinary skill in the art that paperboard has a higher strength than the tissue or writing paper exemplified by McCowan and that one of ordinary would be led to use a particle size distribution heavily focused on the upper end of the disclosed range to manufacture high strength paperboard.

The Examiner disagrees. While McGowan exemplifies tissue and writing paper in the discussion of the disclosed invention, the invention is directed more generally to utilization of a greater proportion of sawdust in paper production generally (col 2, lines 6-16) and it would have been obvious to one of ordinary skill in the art to use sawdust in the manufacture of any kind of paper, including paperboard. Chance et al teaches that paperboard can be loosely defined as a thick stiff paper (col 1, lines 36-37). McGowan

teaches that many types of paper are produced from wood pulp, including newspaper, wrapping paper, tissue, writing paper, cardboard and others and that the strength required in paper depends on the use of the paper (col 1, lines 25-36). For instance, tissue paper and writing paper do not require the strength of newspaper and wrapping paper, and that tissue paper must tear easily (low strength) in some applications.

The only size criteria recited by McGowan for the portion of sawdust usable in papers is that the particle size fraction separated by the number 3 and 12 screens (about 1590 to 6000 micrometers) provides substantial TSF value while smaller particle sizes do not provide any perceived TSF value (col 4, lines 51-56). McCowan does not discourage use of sawdust particles in the lower end of the disclosed range or further direct one of ordinary skill in the art to use particles in the upper end of the disclosed range. One of ordinary skill in the art at the time of the invention would find it obvious from the disclosure of McGowan to select sawdust having a particle size range anywhere within the disclosed range, including embodiments having a particle size within the portion of the disclosed range overlapping the claimed range (between 1590 and 3175 μm), to obtain the strength benefits threfrom. One of ordinary skill in the art would also have been able to determine the strength requirements for the paper or paperboard being manufactured and adjust the selected sawdust particle size for the required strength to match the use of the paper, including a particle size within the claimed range, the results being predictable.

The instant Disclosure does not provide a comparison of the properties of the claimed paperboard with paperboard made using the sawdust of Clapp or McCowan,

only comparisons between the instant invention and paperboard having no sawdust. There is also no evidence showing that the particular claimed range is critical or achieves unexpected results relative to the prior art ranges.

In summary, Clapp discloses good formation for multi-layer liner board or paper comprising wood flour or sawdust with particle sizes from about 177 to about 420 μm. McCowan et al discloses that paper made using sawdust that has been screened to a particle size of greater than about 1/16 inch (about 1590 μm) has good strength properties. The prior art teaches paper and paperboard comprising sawdust with particle sizes that include a significant portion of the claimed range as well as both upper and lower endpoints of the range. It would have been obvious to one skilled in the art at the time of the invention to use sawdust having a particle size within the claimed range to obtain good strength or formation properties.

A. Dependent Claims 2-4.

No additional arguments are presented regarding the dependent claims.

2. Rejections under 35 U.S.C. 103(a) based on Chance in view of Clapp or McCowan, Gomez, and Qiu.

A. Independent Claim 5.

Applicant argues on pp 10-11 that neither Gomez or Qiu teach or suggest a paperboard having sawdust with the claimed particle size.

The Examine agrees, ergo the combination of specific teachings from the references with those of previously discussed references.

Applicant argues on p 10 that the Gomez reference is not combinable with any other reference because it teaches away from the claimed invention by requiring the particle size of the sawdust filler to be less than 150 μm and greater than 10 μm, which expressly teaches away from the claimed paperboard.

The Examiner disagrees. Gomez is used only to teach what was known to those of ordinary skill in the art at the time of the invention, that the inclusion of inexpensive wood waste (i.e.-sawdust from sawing and planing processes) fillers reduces the density of a paper. The size limitation is discussed by Gomez in relation to good sheet formation and minimizing defects in uniformity, not for lowering density.

Applicant argues on p 11 that the Qiu reference does not teach sawdust for lowering the density of paperboard, but only teaches that paperboard strength and density are varied by varying pulp treatments, nip compression, raw materials and additives.

The Examiner agrees and combines the teaching that varying raw materials can affect strength and density with the teaching of Gomez that adding wood waste lowers the density of the paper.

B. Dependent Claims 6-14.

No additional arguments are presented regarding the dependent claims.

C. Independent Claim 15.

The arguments on pp 11-12 are the same as those for Independent Claim 1 above, which have been previously discussed.

D. Dependent Claims 16-18.

No additional arguments are presented regarding the dependent claims.

3. Rejections under 35 U.S.C. 103(a) based on Chance in view of McCowan, Gomez, Qiu and Howard.

It is noted that the subheading should read Rejections under 35 U.S.C. 103(a) based on Chance in view of Clapp or McCowan, Gomez, Qiu and Howard.

A. Independent Claim 19.

A portion of the arguments on p 12 are the same as those for Independent Claim 1 above, which have been previously discussed.

Applicant argues that none of the references alone or in combination teach or suggest a paperboard having sawdust with the claimed particle size range. Applicant further argues that the combination of the five (or six) references is impermissibly based on hindsight.

The Examiner disagrees. The combination takes into account only knowledge which was known by one of ordinary skill at the time the invention was made and does not include knowledge gleaned only from applicant's disclosure.

Chance et al and Clapp or McGowan make obvious a paperboard comprising the claimed amount of sawdust having the claimed particle size range. The specific endpoints from the claimed range are used only to clarify that, since the prior art teaches paper and paperboard comprising sawdust with particle sizes that include a significant portion of the claimed range as well as both upper and lower endpoints of the range, it would have been obvious to one skilled in the art at the time of the invention to use sawdust having a particle size within the claimed range to obtain good strength or formation properties. Qiu et al discloses that it was known in the art to form spirally wound paperboard tubes having multiple plies of differing densities, that the plies can be coated with adhesive prior to winding, and that varying raw materials or additives can vary the density of paperboard. Gomez teaches that it was known in the art adding wood waste can decrease the density of paper. Howard et al teaches that it was known in the art to wind paperboard tubes with plies overlapping at the seams to form a spirally wound tube. All of the claimed features were known in prior art and one skilled in the art could have combined the teachings relied upon from the disclosures of the cited prior art, and the combination would have yielded beneficial (as discussed in the rejections) and predictable results to one of ordinary skill in the art at the time of the invention.

D. Dependent Claims 20-22.

No additional arguments are presented regarding the dependent claims.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of.

No Related Proceeding(s) Appendix is included, but the record is clear that there are no related proceedings based on the Related Appeals and Interferences of the brief and of this examiner's answer, thus it is assumed that the appellant meant to include the Appendix with a statement of "NONE."

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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19 November, 2007

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